

CLAIMS

1. In an optical communication transmitter system, a method for superimposing utility data on an optical signal, said method comprising:

5 receiving utility data from a utility data source;
spreading said utility data according to a spreading code to generate a spread spectrum signal; and
modulating said optical signal with a combination of said spread spectrum signal and a signal carrying payload data.

10 2. The method of claim 1 wherein modulating comprises:
adding said spread spectrum signal to said payload data signal to form a modulation signal; and
applying said modulation signal to input of an optical modulator that modulates
15 said optical signal.

3. The method of claim 1 wherein modulating comprises:
adding said spread spectrum signal to said payload data signal to form a modulation signal; and
20 driving a laser using said modulation signal so that said laser outputs said optical signal modulated with both said payload data and said utility data.

4. The method of claim 1 wherein modulating comprises:

driving a laser using said spread spectrum signal;
modulating output of said laser using said payload data signal.

5 5. The method of claim 1 wherein said utility data comprises a signal
strength indication.

6. The method of claim 1 wherein said utility data comprises firmware.

10 7. The method of claim 1 further comprising:
outputting a modulated optical signal wherein modulation due to said payload
data and modulation due to said utility data overlap spectrally.

15 8. In an optical communication receiver, a method for recovering utility data
from an optical signal, said method comprising:

accepting as input an optical signal modulated with payload data and said utility
data;

multiplying an electrical signal derived from said optical signal by a spreading
sequence to recover said utility data, said electrical signal carrying both said payload data

20 and said utility data; and

recovering said payload data from said optical signal.

9. The method of claim 8 wherein in a spectrum of said optical signal as input, modulation due to said utility data and modulation due to said payload data overlap in the frequency domain.

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10. The method of claim 8 wherein said utility data comprises a signal strength indication.

11. The method of claim 8 wherein said utility data comprises firmware.

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12. In an optical communication transmitter system, apparatus for superimposing utility data on an optical signal, said method comprising:

means for receiving utility data from a utility data source;

means for spreading said utility data according to a spreading code to generate a

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spread spectrum signal; and

means for modulating said optical signal with a combination of said spread spectrum signal and a signal carrying payload data.

13. The apparatus of claim 12 wherein said modulating means comprises:

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means for adding said spread spectrum signal to said payload data signal to form a modulation signal; and

means for applying said modulation signal to input of an optical modulator that modulates said optical signal.

14. The apparatus of claim 12 wherein said modulating means comprises:
means for adding said spread spectrum signal to said payload data signal to form a
modulation signal; and

5 means for driving a laser using said modulation signal so that said laser outputs
said optical signal modulated with both said payload data and said utility data.

15. The apparatus of claim 12 wherein said modulating means comprises:
means for driving a laser using said spread spectrum signal;
10 means for modulating output of said laser using said payload data signal.

16. The apparatus of claim 12 wherein said utility data comprises a signal
strength indication.

15 17. The apparatus of claim 12 wherein said utility data comprises firmware.

18. The apparatus of claim 12 further comprising:
means for outputting a modulated optical signal wherein modulation due to said
payload data and modulation due to said utility data overlap spectrally.

20 19. In an optical communication receiver, apparatus for recovering utility data
from an optical signal, said apparatus comprising:

means for accepting as input an optical signal modulated with payload data and
said utility data;

means for multiplying an electrical signal derived from said optical signal by a spreading sequence to recover said utility data, said electrical signal carrying both said payload data and said utility data; and

5 means for recovering said payload data from said optical signal.

20. The apparatus of claim 19 wherein in a spectrum of said optical signal as input, modulation due to said utility data and modulation due to said payload data overlap in the frequency domain.

10 21. The apparatus of claim 19 wherein said utility data comprises a signal strength indication.

22. The apparatus of claim 19 wherein said utility data comprises firmware.

15 23. In an optical communication transmitter system, apparatus for superimposing utility data on an optical signal, said apparatus comprising:

a spread spectrum processing block that spreads said utility data using a spreading sequence to generate a spread spectrum signal; and

20 a modulation system that modulates said optical signal using both said payload data and said utility data as spread by said spread spectrum processing block.

24. The apparatus of claim 23 wherein said modulation system comprises:

a summer that adds said spread spectrum signal to said payload data to form a modulation signal; and

an optical modulator that modulates said optical signal responsive to said modulation signal.

25. The apparatus of claim 23 wherein said modulation system comprises:

a summer that adds said spread spectrum signal to said payload data to form a modulation signal; and

wherein a laser is driven using said modulation signal so that said laser outputs said optical signal modulated with both said payload data and said utility data.

26. The apparatus of claim 23 wherein said modulation system comprises:

an optical modulator that modulates output of a laser using said payload data signal; and

wherein said laser is driven using said spread spectrum signal.

27. The apparatus of claim 23 wherein said utility data comprises a signal strength indication.

28. The apparatus of claim 23 wherein said utility data comprises firmware.

29. The apparatus of claim 23 further wherein modulation imposed on said optical signal due to said payload data and modulation imposed on said optical signal due to said utility data overlap spectrally.

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30. In an optical communication receiver, apparatus for recovering utility data from an optical signal, said apparatus comprising:

an input that accepts an optical signal modulated with payload data and said utility data;

10 a spread spectrum processing block that uses a spreading sequence to recover said utility data from an electrical signal derived from said optical signal.

31. The apparatus of claim 30 wherein in a spectrum of said optical signal as input, modulation due to said utility data and modulation due to said payload data overlap
15 in the frequency domain.

32. The apparatus of claim 30 wherein said utility data comprises a signal strength indication.

20 33. The apparatus of claim 30 wherein said utility data comprises firmware.